Otter Tail Ag Enterprises, LLC.
ethanol A Clean Air Choice

Grain Receiving Baghouse

Operations Description

The grain receiving baghouse is a stationary filter that consists of an induced draft (ID) fan along with and indexing arm and a reverse air system. The ID fan creates a vacuum which draws dust from 3 dump pits, 2 conveyors, 2 legs, 1 bin fill conveyor, and 2 bins. As the dust enters the baghouse it is drawn across the filters which separate the dust from the air. The resulting filtered air exists the baghouse travels through the ID fan then exits the system through the stack.

As the filters become coated with dust the reverse air system cleans the dust from the filters. The reverse air system blows compressed air backwards against the bags causing the dust to fall from the filter. This system uses an indexing arm which rotates inside the unit to clean all filters. As the dust falls from the filters is accumulates in the bottom of the baghouse where it is conveyed back into the grain receiving conveyors and into the grain bins.

Effected Equipment:

- **Truck pit #1**
- **Truck pit #2**
- **Rail pit**
- **Y 1212**
- **Y1232**
- **BE 1240**
- **BE 1220**
- **Y1301**
- **TK 1310**
- **TK 1320**

Baghouse Operating Procedures

The grain receiving baghouse is essential to operating the grain receiving system. The primary reason for its operation is safety. If dust is not drawn off the effected equipment and allowed to accumulate a dust explosion is possible. Dust suppression is also essential to OTAE's environmental compliance policies. Due to these factors at no time is it permitted to continue grain receiving operations if the grain receiving baghouse is shutdown. The grain receiving baghouse must be in operation before any of the effected equipment can be energized.

Operating parameters

- **All blast gates must be at least partially opened. (never isolated)**
- **Baghouse differential pressure must be between 1 inch to 6 inches W.C.**

- **Particulate emissions should not be present at anytime.**
- **All components of the baghouse must be in operation at all times.**

Control Practices

The grain receiving baghouse is controlled by a local PLC. The local controls consist of level detection in the baghouse and also motion detection of the associated equipment. In the event the system experiences and alarm an alarm signal will be sent to the plant distributed control system. (DCS) Depending on the severity of the alarm the unit will either continue to operate and allow the plant to receive corn. Or it will shut the system down and prohibit the facility to unload corn.

Operator checks are also an integral part of the baghouse control. Operators will be making regular rounds in the area to ensure all equipment is functioning properly. Also operators will be obtaining differential pressure readings once per day while the unit is in operation. If the units is outside of its 1" – 6" operating parameter the situation is to reported immediately, and grain receiving operations are to stop until the unit has returned to compliance. If visible emissions are detected the unit is to shut down and grain receiving operations to stop immediately until the unit has be returned to normal operation.

Employee Training Program

OTAE's employee training program is based with on the job training with supplemental classroom training. All of OTAE's environmental policies are backed by the OTAE SOPs. SOPs are kept in the control room and are available to all employees.

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Safety

These hazards present themselves in operating the Grain Handling section

Mechanical hazards are present form rotating equipment such as conveyors and elevators.

- Keep arms and hands away from operating conveyors and elevators to avoid personal injury.
- Start conveyor equipment only after a complete inspection following the recommendations from the manufacturer.
- Never reach into a conveyor without the power being locked out.

Dusts, including grain dusts, are a fire and explosion hazard, In order to prevent or minimize the damage from dust explosions, two things must be done..

- Eliminate and or control potential ignition sources such as welding and cutting, electrical acrs, hot bearings, ect.
- Control fuel source(grain dust)

Of the two components, fuel control is the most difficult and expensive to achieve. However, assuming an initial explosion does occur, the best way to mitigate the destructive consequences of a secondary explosion is by effective dust control. Ensure dust filters are cleaned/ changed regularly as needed.

Prestart up

- Conduct a prestart up safety review of the Grain Receiving, Grain Storage and Grain Milling Areas.
- Complete and close out all maintenance and hot work permits.
- Complete the lock/tag out list.
- Inspect conveyors and elevators in the area to check for mechanical integrity, and ensure all guards are in place.
- Check that all equipment is off with their breakers closed at the MCC.
- Place all control loops in Manual at zero valve output on the DCS.
- Ensure that all utilities are commissioned and available.

Start Up

Press Start on the DCS Interface to initiate the automatic startup of the Grains Receiving and Storage systems. This will automatically start the Grain Receiving Dust System.

Equipment that will start:

- Main Fan
- Reverse Air Fan
- Index arm
- Rotary Valve
- Conveyor

Once the Grains Receiving Dust System is running, the Receiving equipment will start automatically. It now is able to receive corn.

Equipment that will start:

- Y-1301 Top Conveyor
- BE-1240 or BE-1220 Bucket elevator
- Y-1232 or Y1212 Receiving Conveyor